

Strategic Energy and Water Plan
North Carolina Department of Health and Human Services
August 28, 2020

Prepared By:

Division of Property & Construction

3026 Mail Service Center

Raleigh, NC 27699-3026

Executive Summary

The North Carolina Department of Health and Human Services (DHHS) has approximately 635 buildings at 14 different institutions across the state encompassing roughly 7.6 million square feet of space. These institutions include psychiatric hospitals, neuro-medical treatment centers, alcohol and drug abuse treatment centers, developmental centers, and vocational rehabilitation centers.

DHHS is committed to improving building energy performance and water consumption at these institutions to reduce costs and the potential for any negative impact to the environment.

DHHS will reduce energy and water usage by identifying and implementing projects to improve the efficiency of utility systems. DHHS has utilized various funding sources including American Recovery and Reinvestment Act (ARRA) and repair and renovation funds to complete energy conservation projects.

General Items for the DHHS Strategic Energy and Water Plan include the following:

1. Consolidating building occupants in buildings with a high square foot per person so that buildings may be closed off and HVAC system temperatures set back or turned off completely.
2. Recommissioning existing HVAC control systems in order to optimize energy savings. Verification of proper outdoor air set points on HVAC systems.
3. Tuning up of existing boilers to provide optimal burner efficiency.
4. When HVAC equipment is due for replacement, replace this equipment with high efficiency replacements. When office equipment and appliances are due for replacement, replace with energy star rated equipment.
5. Survey each campus for energy savings opportunities. Identify system leaks and repair them.
6. Replace existing lighting (incandescent or fluorescent) with LED lighting.
7. Install lighting occupancy sensors in appropriate areas/rooms.
8. Implement temperature setbacks for non-occupied time periods for non-patient areas. Provide proper deadband between heating and cooling setpoints in all occupancies.
9. Prohibit personal space heaters and mini refrigerators.
10. Repair and caulk leaks in windows and doors. Add building insulation where needed or where it does not exist.

Current elements of the DHHS Strategic Energy and Water Plan include the following:

1. Identifying and implementing renovation projects when required due to the age and condition or change in use of buildings. The requirements of General Statute 143.135-25 which mandates minimum energy and water reduction for new construction and major renovation projects will ensure improved energy and water use performance.

These improvements generally include some or all the following: replacing windows; upgrading building insulation; and replacing HVAC, controls, lighting, and plumbing systems.

1. Lighting replacement with LED fixtures at multiple facilities.
2. At J. Iverson Riddle Developmental Center, replace the domestic water heater at the Mulberry Building.
3. At J. Iverson Riddle Developmental Center, replace aging domestic water and sewer piping.
4. At John Umstead Campus, upgrade the HVAC system at Building 27A.
5. At Julian Keith ADATC, upgrade Dorms 1 & 2.
6. At Julian F. Keith ADATC, replace the aging condensing unit at the Activities/Gym Building.
7. At O'Berry NMTC, upgrade the HVAC system at the Administration Building.
8. At O'Berry NMTC, replace the windows at ELC-2.
9. Completing various selected smaller projects in buildings to address specific needs and to reduce energy and water usage including replacing existing inefficient HVAC equipment with modern and energy efficient equipment.

An Energy Manager (Maintenance Director) is assigned at each institution to ensure that energy conservation projects are completed in a timely manner.

The main Key Performance Indicators (KPIs) consist of British thermal units per gross square foot (btu/gsf) for energy use and gallons/gsf for water use. Due to the expense of metering each building, utility invoices will be utilized to monitor and report overall energy and water usage for each facility.

Organizational Support for Energy Culture Change

1. Educate staff through presentations, emails, handouts, subcommittees, and other effective forms of communication about energy and water conservation practices they can implement daily.
2. Incorporate energy and water conservation discussions and presentations as appropriate into institutional and departmental meetings.
3. Encourage staff to identify and attend energy and water conservation training.
4. Establish policy that requires evaluation of both costs and energy efficiency when selecting equipment to be purchased and that requires giving preference to Energy Star products when possible.

Organizational Culture Change Projects

Past 12 months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Continuation of existing activities							Facility Maintenance and Division of Property & Construction	GF

Next 12 months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Educate staff regarding NC energy legislation, State Energy Office policies and resources, and Strategic Energy Planning techniques.							Facility Maintenance and Division of Property & Construction	GF
Encourage staff to identify and attend energy and water conservation training.							Facility Maintenance and Division of Property & Construction	GF
Establish policy that requires evaluation of both costs and energy efficiency when selecting equipment to be purchased and that requires giving preference to Energy Star products when possible.							Facility Maintenance and Division of Property & Construction	GF

1. Supply Side

- a. Review all accounts with utility providers to ensure lowest cost Rate Schedule is in effect for each facility.
- b. Identify locations, meter ID, and account numbers for all existing primary meters installed by utility providers. Request utility providers to install new digital meters to replace any analog meters. Request new digital meters to be remote reading type compatible with existing Building Management System (BMS) software whenever possible.

Past 12 months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Continuation of existing activities							Facility Energy Manager and Division of Property & Construction	GF

Next 12 months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Contact Duke Progress and the local utility provider to review all electrical rates							Facility Energy Manager	GF
Contact Piedmont Natural Gas to review all gas rates							Facility Energy Manager	GF
Contact local water service providers to review water rates							Facility Energy Manager	GF

2. Demand Side

- a. Building assessments will be completed at each DHHS institution to identify the condition of buildings including the age, type, and condition of the building equipment and lighting. These building assessments will serve as the basis for identifying building needs, developing scope of work for projects, developing estimated project costs, prioritizing project needs, and for requesting and obtaining funding to complete the projects and realize reductions in energy and water consumption.
- b. Facility Maintenance staff at each institution will make the effort to identify potential energy and water conservation improvement opportunities by evaluating the existing HVAC control system including considering the following:
 - i. Time of day/night setback sequences.
 - ii. Chilled water and hot water set point optimization.
 - iii. Air handling unit (AHU) set point optimization.
 - iv. Outdoor air damper operation (closed when building is not occupied)
 - v. General verification of the operation of the building control system.
 - vi. Installation of variable speed drives.

Past 12 Months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Broughton Hospital – Gym Upgrades					\$945,000		Division of Property & Construction	RR
Caswell Center – Boiler Addition at Parrott & Byrum Buildings					\$1,000,000		Division of Property & Construction	RR
Caswell Center - Cooling Tower Replacement					\$460,000		Division of Property & Construction	RR
Dorothea Dix Campus – Cooling Tower Repairs					\$67,000		Division of Property & Construction	RR
J. Iverson Riddle Developmental Center – Replace chiller serving Spruce Building					\$140,000		Division of Property & Construction	RR

Murdoch Developmental Center – Infirmery, Medical Clinic & Dental Clinic HVAC Upgrades					\$3,617,000		Division of Property & Construction	RR
O’Berry Neuro Medical Treatment Center – HVAC Upgrades					\$1,838,000		Division of Property & Construction	RR
O’Berry Neuro-Medical Treatment Center – ELC-1 Building Alterations					\$6,923,000		Division of Property & Construction	RR
R.J Blackley: Building 24A Chiller Replacement					\$369,000		Division of Property & Construction	RR
Walter B. Jones ADATC – Units 4, 5, & 6 Heat Pump Replacement					\$189,000		Division of Property & Construction	RR
WorkSource West – HVAC Upgrades to Old Farm Colony Building					\$376,000		Division of Property & Construction	RR

Next 12 Months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Lighting replacement with LED fixtures – Multiple facilities.					\$250,000		Division of Property & Construction	2020 R&R
J. Iverson Riddle Developmental Center – Mulberry Building Domestic Water Heater Replacement					\$74,000		Division of Property & Construction	2020 R&R

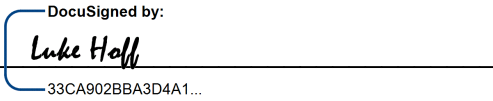
J. Iverson Riddle Developmental Center – Willow Cottage Replace Domestic Water & Sewer Piping					\$210,000		Division of Property & Construction	2020 R&R
John Umstead Campus – Building 27A – HVAC Upgrades					\$236,000		Division of Property & Construction	2020 R&R
Julian F. Keith ADATC – Dorms 1 & 2 Building Upgrades					\$2,000,000		Division of Property & Construction	2020 R&R
Julian F.Keith ADATC – Activities/ Gym Building A/C Unit Replacement					\$75,000		Division of Property & Construction	2020 R&R
O’Berry NMTC – Administration Building HVAC Upgrades					\$355,000		Division of Property & Construction	2020 R&R
O’Berry NMTC – Window Replacement at ELC-2					\$457,000		Division of Property & Construction	2020 R&R

The DHHS Utility Report showing energy and water usage and associated costs is included as a separate attachment. Note the following regarding the DHHS Utility Report:

1. The Special Care Center is Longleaf Neuro-Medical Treatment Center located at 4761 Ward Boulevard, Wilson, NC 27893.
2. The John Umstead Hospital data includes the R.J. Blackley Alcohol and Drug Abuse Treatment Center (ADATC) located at 1003 12th Street, Butner, NC 27509.
3. The Central Regional Hospital data includes the John Umstead Hospital (and R.J. Blackley ADATC) data starting in 2010-11.
4. The Dorothea Dix Hospital includes the Governor Morehead School starting in 2007-08.
5. The Vocational Rehabilitation combines both Work Source East located at 902 Corporate Drive, Goldsboro, NC 27534 and Work Source West located at 200 Enola Road, Morganton, NC 28655.

Confirmation:

This Strategic Energy and Water Plan is approved for the NC Department of Health and Human Services by its authorized representative, Luke O. Hoff, PE, Director of the Division of Property and Construction.

Approved:  _____
DocuSigned by:
33CA902BBA3D4A1...

Date: 8/28/2020 _____